



RESEARCH REPORT

The prevalence and correlates of DSM-IV disorders in the Iraq Mental Health Survey (IMHS)

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Data on the prevalence and correlates of anxiety, mood, behavioral, and substance disorders are presented from a 2007-8 national survey of the Iraq population, the Iraq Mental Health Survey (IMHS). The IMHS was carried out by the Iraq Ministry of Health in collaboration with the Iraq Ministry of Planning and the World Health Organization (WHO) World Mental Health (WMH) Survey Initiative. Interviews were administered to a probability sample of Iraqi household residents by trained lay interviewers. The WHO Composite International Diagnostic Interview (CIDI) was used to assess DSM-IV disorders. The response rate was 95.2%. The estimated lifetime prevalence of any disorder was 18.8%. Cohort analysis documented significantly increasing lifetime prevalence of most disorders across generations. This was most pronounced for panic disorder and post-traumatic stress disorder, with lifetime-to-date prevalence 5.4-5.3 times as high at comparable ages in the youngest (ages 18-34) as oldest (ages 65+) cohorts. Anxiety disorders were the most common class of disorders (13.8%) and major depressive disorder (MDD) the most common disorder (7.2%). Twelve-month prevalence of any disorder was 13.6%, with 42.1% of cases classified mild, 36.0% moderate, and 21.9% serious. The disorders most often classified serious were bipolar disorder (76.9%) and substance-related disorders (54.9%). Socio-demographic correlates were generally consistent with international epidemiological surveys, with the two exceptions of no significant gender differences in mood disorders and positive correlations of anxiety and mood disorders with education. Only 2.2% of IMHS respondents reported receiving treatment for emotional problems in the 12 months before interview, including 23.7% of those with serious, 9.2% with moderate, and 5.3% with mild disorders and 0.9% of other respondents. Most healthcare treatment, which was roughly equally distributed between the general medical and specialty sectors, was of low intensity. Further analyses of barriers to seeking treatment are needed to inform government efforts to expand the detection and treatment of mental disorders.

Key words: Mental illness, epidemiology, Iraq, World Mental Health Surveys

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There is an extensive literature on the mental health consequences of deployment in Iraq for US and UK armed forces (1,2) and their families (3,4). Yet, virtually nothing is known about the mental health of the Iraqi population, with the exception of some research documenting high rates of psychopathology among Iraqi children (5) and asylum seekers (6). Good reasons exist to believe that mental disorders are common in the Iraqi population. First, torture was common in Iraq for at least three decades before the March 2003 invasion, with surveys suggesting that up to 50% of households in some areas had a relative who was tortured (7). Epidemiological research shows clearly that torture victims have high rates of mental illness (8). Second, the mortality rate in Iraq increased substantially since the March 2003 invasion, although estimates of the magnitude of this increase vary widely (9-11). Epidemiological research shows clearly that exposure to mass violence and death is associated with high rates of mental illness (12). Third, Refugees International estimates that more than 1.5 million of the roughly 25 million pre-invasion citizens of Iraq are now internally displaced by the war and another 2.5 million living as refugees in neighboring countries (13). Epidemiological evidence shows clearly that this kind of mass displacement is associated with high rates of mental illness (14). Fourth,

many Iraqis continue to live in a climate of fear of violence and associated disruptions to daily activities that could have adverse effects on their mental health.

In an effort to obtain basic descriptive data on the prevalence and correlates of mental disorders in the Iraqi household population for treatment planning purposes, the Iraq Ministry of Health, in collaboration with the Iraq Ministry of Planning and the World Health Organization (WHO), carried out a national mental health needs assessment survey in conjunction with the Iraq Family Health Survey (9). This Iraq Mental Health Survey (IMHS) was implemented as part of the WHO World Mental Health (WMH) Survey Initiative, a series of nationally representative mental health needs assessment surveys in 28 countries that use consistent measurement and field procedures to generate valid cross-national comparative data (15). The current report presents the first results from the IMHS.

METHODS

Sample

The IMHS is a nationally representative survey of 4,332





adults (18 years +) carried out simultaneously with the Iraq Family Health Survey (IFHS). Both surveys were completed in 2006-7 under the direction of the Iraq Ministry of Health, the Iraq Central Organization for Statistics and Information Technology (COSIT), the Ministry of Health of the Kurdistan region (MoHK), and the Kurdistan Regional Statistics Office (KRSO). Both the IFHS and IMHS were administered face-to-face in a nationally representative sample of the Iraqi household population. The IMHS was administered in the central and southern governorates during August and September, 2006, in Anbar during October and November, 2006, and in the Kurdistan region during February and March, 2007. The IMHS response rate was 95.2%.

The sample for the IMHS was a subset of the block-level sample segments used in the IFHS. Iraq was divided into 56 different strata for purposes of selecting this initial sample. These strata were made up of three in each of the 17 governorates outside of Baghdad (metropolitan, representing the governorate capital; other urban area outside the capital; and rural area) and five in Baghdad (three parts of the city representing Sadar City, Rusafah side, and Al-Karkh side; all other urban areas in the city; and all rural areas outside the city in the metropolitan area). Each stratum was divided into block-level sample segments that were paired for purposes of sample selection. Eighteen such segments (9 pairs) were selected with probabilities proportional to size in each of the 56 population strata. Five households were then selected randomly within each segment, and one adult (ages 18+) was selected using Kish tables for interview within each household. Some segments in the Al-Karkh stratum in Baghdad and in the Anbar and Nineveh governorates were replaced due to security problems. These replacement segments were over-sampled in anticipation of low response rates.

As the sampling frame was based on administrative data, a new household listing was carried out before selecting households in each segment. The measures of segment size were modified based on this new enumeration and the data weighted to adjust for discrepancies between expected and observed numbers of households. An additional weight was used to adjust for differential probability of household selection across strata and for differential probability of within-household selection as a function of number of household adults. Finally, a post-stratification weight was applied to the data to match the joint distribution of the sample on age, gender, and geography to the population distribution.

Diagnostic assessment

As noted above, the IMHS was carried out as part of the WMH Survey Initiative (16). Diagnoses in the IMHS, as in all other WMH surveys (17), are based on Version 3.0 of the WHO Composite International Diagnostic Interview (CIDI) (16), a fully-structured lay-administered interview that generates diagnoses according to the definitions and criteria of both the ICD-10 and DSM-IV diagnostic systems. DSM-IV

criteria are used here. The disorders assessed include mood disorders (major depressive disorder, MDD; dysthymic disorder, bipolar I and II disorder, sub-threshold bipolar disorder), anxiety disorders (panic disorder, agoraphobia without a history of panic disorder, generalized anxiety disorder, GAD; specific phobia, social phobia, post-traumatic stress disorder, PTSD; obsessive-compulsive disorder, OCD), behavioral disorders (intermittent explosive disorder, attention-deficit/hyperactivity disorder), and substance-related disorders (alcohol abuse, alcohol dependence with abuse, drug abuse, drug dependence with abuse). Diagnostic hierarchy rules and organic exclusion rules were used in making all diagnoses.

As detailed elsewhere (18), blinded clinical reappraisal interviews with a probability sub-sample of CIDI respondents in a number of other WMH surveys found generally good concordance between diagnoses based on the CIDI and those based on the Structured Clinical Interview for DSM-IV (SCID) (19). Logistical complexities made it impossible to carry out a clinical reappraisal study in the IMHS.

The CIDI assesses lifetime disorders and then obtains retrospective information about age-of-onset (AOO) and disorder recency. We focus in the current report on lifetime and 12-month prevalence. Based on evidence that retrospective AOO reports are often erroneous (20), a special question sequence was used to improve accuracy of AOO reporting. This series began with questions designed to emphasize the importance of accurate response: "Can you remember your exact age the *very first time* (emphasis in original) when you (had the symptom/syndrome)?" Respondents who answered "no" were probed for a bound of uncertainty by moving up the age range incrementally (e.g., "Was it before you went to school?"; "Was it before age 13?"; etc.). Onset was set at the upper end of the bound of uncertainty (e.g., age 12 years for respondents who reported that onset was before the beginning of their teens). Experimental research has shown that this question sequence yields more plausible responses than standard age-of-onset questions (21).

Twelve-month cases were classified in terms of a three-category scheme of serious, moderate, or mild, based on additional information collected in the interviews. Cases were classified *serious* if they had any of the following: a 12-month suicide attempt with serious lethality intent; substantial work limitations due to a mental or substance-related disorder; bipolar I disorder, substance dependence with a physiological dependence syndrome, a behavioral disorder associated with repeated serious violence, or any disorder that resulted in 30 or more days out of role in the year before interview.

Cases not classified serious were classified *moderate* if they had any of the following: past year suicide gesture, plan, or ideation; 12-month substance dependence without serious role impairment; at least moderate work limitation due to a mental or substance-related disorder; or any 12-month disorder with at least moderate role impairment in two or more domains of the Sheehan Disability Scales (SDS, 22). The SDS assessed disability in work role performance, household maintenance, social life, and intimate relationships on





0-10 visual analogue scales with verbal descriptors, and associated scale scores, of none (0), mild (1-3), moderate (4-6), severe (7-9), and very severe (10).

All other 12-month cases were classified *mild*. To assess the meaningfulness of these severity ratings, we compared number of days in the past 12 months that respondents reported being totally unable to carry out their normal daily activities because of mental or substance-related problems. The mean (\pm standard error) of this variable was significantly higher ($F_{2,4,329} = 77.2, p < 0.001$) among respondents classified serious (59.9 ± 14.6) than moderate (9.3 ± 1.7) or mild (7.0 ± 3.1).

Treatment

All IMHS respondents were asked if they ever received treatment for “problems with your emotions or nerves or your use of alcohol or drugs”. Separate assessments were made for different types of professionals. Follow-up questions were then asked about age at first and most recent contact with each type of provider as well as number and duration of visits to each provider in the past 12 months. Respondents were also asked about specific medications received in the past 12 months to treat problems with emotions, nerves, or use of alcohol or drugs (name of medication, daily dose, and duration of treatment). Treatment was classified into the following categories for purposes of the current report: mental health specialist (psychiatrist, psychologist, and other non-psychiatrist mental health professionals), general medical (primary care doctor, other general medical doctor, nurse, or any other health professional not in the specialty mental health sector), and human services (religious or spiritual advisor, social worker or counselor in any setting other than a specialty mental health setting). As all the human services treatment was provided by spiritual advisors, we use the term *spiritual advisor* rather than *human services* when we report results. We also asked about complementary-alternative medical (CAM) providers (e.g., spiritualists or native healers), but none of the IMHS respondents reported treatment from CAM providers. Mental health specialty treatment was combined with general medical into a broader category of healthcare treatment.

Based on available evidence-based guidelines (23-29), treatment was classified as *adequate* if the patient received either pharmacotherapy (one month or longer of medication plus at least four visits to any type of professional) or psychotherapy (at least eight visits with any healthcare or human services professional). The decision to require at least four visits for pharmacotherapy was based on published treatment guidelines (23-28). At least eight sessions were required for minimally adequate psychotherapy, based on the fact that clinical trials demonstrating effectiveness have generally included at least eight psychotherapy visits (23-28). Based on the fact that respondents who began treatments shortly before the interview may not have had time to fulfill requirements and the fact that very brief treatments have been developed for certain disorders (30,31), we created a broader definition of *follow-up treat-*

ment that consisted of receiving at least two visits to an appropriate treatment sector (one visit for presumptive evaluation/diagnosis and at least one visit for treatment).

Socio-demographic correlates

The socio-demographic correlates of lifetime disorders considered here include age at interview (18-34, 35-49, 50-64, 65+), sex, and education. Education was grouped into the categories of low (0 years of education), low-average (some education but no secondary education; 1-6 years), high-average (at least some secondary, but no post-secondary education; 7-12 years), and high (at least some post-secondary education; 13+ years). These socio-demographic variables were used as predictors of lifetime onset in a survival framework, which means that each variable was coded as of each year in the life of each respondent. This was done for education by assuming that each respondent with any education began school at age 5 and continued through the completion of their education without interruption.

A broader set of socio-demographic variables was used to study 12-month disorders. In addition to those mentioned above, these include marital status (currently married, previously married, never married) and family income. Family income was divided into four categories. Low income was defined as a ratio of income to number of family members (I/F) less than one half the median in the total sample. Low-average income was defined as any income greater than low up to 1.5 times the median I/F. High-average income was defined as any income higher than low-average up through 3.0 times the median I/F. High income was defined as any income higher than high-average.

Analysis procedures

As noted above, the data were weighted to adjust for differential probabilities of selection and to adjust for residual differences between the sample and the Iraq population on the cross-classification of respondent age, sex, and geographic residence. These weighted data were used to estimate lifetime and 12-month prevalence. Survival analysis was then used to estimate cumulative lifetime probability of disorder over the life course. The actuarial method (32) implemented in SAS V8.2 (33) was used rather than the more familiar Kaplan-Meier method (34) of generating survival curves, because the former has an advantage over the latter in estimating onsets within a year.

Discrete-time survival analysis (35) with person-year as the unit of analysis was used to examine socio-demographic predictors of lifetime disorders. The survival coefficients and their standard errors were exponentiated and are reported as odds ratios (ORs) with 95% confidence intervals. Age at interview was one of the predictors. A significant effect of age at interview can be interpreted as a cohort effect; that is,





as a secular change in the prevalence of a disorder at a given age across successive generations. Logistic regression analysis (36) was used to study socio-demographic correlates of 12-month disorders and treatment.

All analyses used design-based methods to adjust for the geographic clustering and weighting of data. Standard errors were estimated using the Taylor series linearization method implemented in SUDAAN (37). Multivariate significance was evaluated with Wald χ^2 tests based on design-based coefficient variance-covariance matrices. Statistical significance was evaluated using two-sided design-based tests and the 0.05 level of significance.

RESULTS

Lifetime prevalence of DSM-IV mental disorders

The estimated lifetime prevalence of any DSM-IV/CIDI disorder is 18.8%. The most prevalent class of disorders is anxiety disorders (13.8%) followed by mood disorders (7.5%), behavioral disorders (1.8%), and substance-related disorders (0.9%). The most prevalent individual lifetime disorders are major depressive disorder (7.2%), OCD (4.6%), specific phobia (4.2%), and GAD (3.7%) (Table 1).

Prevalence estimates vary significantly with age for a number of anxiety and mood disorders, but not behavioral or substance-related disorders. Prevalence estimates increase with age in a generally monotonic fashion for GAD, PTSD, and MDD, but decrease monotonically with age for specific phobia. A significant age difference in OCD is due to a much lower prevalence in the 65+ age group (1.7%) than in younger groups (3.7-5.2%) rather than to a monotonic decrease with age.

Age-of-onset distributions

The distributions of cumulative lifetime risk estimates for fixed percentiles for each disorder show that median AOO (i.e., the 50th percentile on the AOO distribution) is earliest for behavioral disorders (age 17), latest for mood disorders (age 46), and intermediate for anxiety disorders (age 25) (Table 2). The AOO distribution could not be estimated for substance-related disorders because of low prevalence. Within the anxiety disorders, median AOO is earliest for the phobias (ages 7-14) and PTSD (age 16), latest for GAD and OCD (ages 51-54), and intermediate for panic disorder (age 35).

The AOO distributions of individual disorders differ not only in medians but also in ranges. It is useful to examine these differences by focusing on the inter-quartile range (IQR; the number of years between the 25th and 75th percentiles of the AOO distributions) for each disorder. The IQR is a mere 5-8 years for the phobias. This means that the majority of people with phobias have their first onset in a very narrow age range during the childhood or adolescent

years. The IQR for PTSD is also quite narrow, 12 years, meaning that the majority of Iraqis who ever develop PTSD do so between early adolescence and their mid-20s (13-25). The IQR for intermittent explosive disorder is wider, 17 years (14-31). The IQRs for the remaining disorders, in comparison, are quite wide, between 26 and 34 years.

Projected lifetime risk

The AOO distributions were used to generate estimates of projected lifetime risk as of age 75. If all sample respondents lived to age 75, the model estimates that 40.8% of them would have a lifetime history of at least one of the disorders considered here. This is more than twice the lifetime prevalence-to-date of 18.8% in the sample. Disorders with the highest lifetime risk-to-prevalence (R/P) ratios are MDD (R/P = 3.9), GAD (3.1), and PTSD (3.6). The lowest R/P ratios, in comparison, are for the phobias (1.0), OCD (1.2), intermittent explosive disorder (1.3), and panic disorder (1.6). These between-disorder differences reflect difference in AOO.

Inter-cohort differences in lifetime risk

We attempted to determine if lifetime risk of mental disorders increased over the generations, possibly as a function of inter-generational variation in exposure to sectarian violence, by using discrete-time survival analysis to predict lifetime risk of mental disorders separately in the age groups 18-34, 35-49, 50-64, and 65+. A generally decreasing pattern of ORs is seen with increasing age, indicating that the lifetime prevalence of mental disorders at a given age has increased in successive cohorts of the Iraqi population over the generations studied here (Table 3). The largest increase from the oldest to the youngest generation in the sample (i.e., respondents in the age range 18-34 vs. 65+ at the age of interview) is for panic disorder (5.4). Consistent with the possibility that these increases might be due to increases in sectarian violence, the second-largest youngest-to-oldest OR is for PTSD, where the odds of lifetime prevalence in the youngest generation is 5.3 times as high as at the same age in the oldest generation. The ORs are also elevated for every one of the disorders considered here, with ORs in the range 1.7-5.3.

The cohort model was also elaborated to determine whether inter-cohort differences decrease significantly with increasing age. Differences were examined separately for early-onset cases (defined as onsets as of the AOO of the first one-third of all lifetime cases), average-onset cases (defined as onsets in the AOO range of the 34th-67th percentiles of cases), and late-onset cases (defined as onsets in the AOO range of the 68th or higher percentiles of cases) separately for anxiety and mood disorders. No more refined disorder-specific analyses were possible because of low statistical power. Results show that cohort effects do, in fact, change with age, but not in a simple monotonic fashion (detailed



**Table 1** Lifetime prevalence of DSM-IV/WMH-CIDI disorders in the total sample and in four age groups

	Age group										χ^2_3
	Total		18-34		35-49		50-64		65+		
	%	SE	%	SE	%	SE	%	SE	%	SE	
<i>Anxiety disorders</i>											
Panic disorder	1.4	0.3	1.3	0.4	2.1	0.5	0.6	0.3	1.2	0.7	8.8*
Generalized anxiety disorder	3.7	0.5	2.8	0.4	4.2	0.9	4.2	1.2	8.2	2.7	9.8*
Social phobia	0.8	0.2	0.9	0.3	1.0	0.5	0.3	0.2	0.4	0.4	3.6
Specific phobia	4.2	0.4	4.9	0.7	3.9	0.8	3.6	1.2	1.2	0.6	13.5*
Agoraphobia	0.8	0.2	1.1	0.4	0.4	0.2	0.4	0.2	0.6	0.6	3.7
Post-traumatic stress disorder	2.5	0.2	1.6	0.4	2.9	0.5	3.7	0.8	4.9	1.9	11.8*
Obsessive-compulsive disorder	4.6	0.5	5.1	0.7	3.7	0.6	5.2	1.0	1.7	0.8	11.5*
Any anxiety disorder	13.8	0.8	13.8	1.1	13.2	1.1	14.7	1.8	14.6	2.2	0.7
<i>Mood disorders</i>											
Major depressive disorder	7.2	0.6	4.9	0.6	7.9	1.0	11.7	2.1	13.0	2.1	27.4*
Dysthymic disorder	0.2	0.1	0.2	0.1	0.1	0.0	0.6	0.6	0.0	0.0	8.3
Bipolar disorder	0.2	0.1	0.1	0.0	0.5	0.4	0.4	0.2	0.0	0.0	7.1
Any mood disorder	7.5	0.6	5.0	0.7	8.5	1.0	12.1	2.1	13.0	2.1	27.9*
<i>Behavioral disorders</i>											
Attention-deficit/hyperactivity disorder	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.0	5.7
Intermittent explosive disorder	1.7	0.2	1.5	0.3	2.9	0.8	1.4	0.7	0.7	0.7	5.8
Any behavioral disorder	1.8	0.2	1.5	0.3	3.0	0.8	1.4	0.7	0.7	0.7	6.4
<i>Substance-related disorders</i>											
Alcohol abuse	0.7	0.2	0.7	0.3	0.9	0.5	0.7	0.4	0.3	0.3	1.1
Alcohol dependence	0.2	0.1	0.3	0.2	0.1	0.1	0.2	0.2	0.0	0.0	4.4
Drug abuse	0.2	0.1	0.2	0.2	0.1	0.1	0.1	0.1	0.0	0.0	3.7
Drug dependence	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.0
Any substance-related disorder	0.9	0.3	0.9	0.3	0.9	0.5	0.8	0.4	0.3	0.3	1.9
<i>All disorders</i>											
Any disorder	18.8	0.9	17.6	1.2	18.9	1.4	22.5	2.5	20.3	2.2	5.4
Two or more disorders	6.3	0.7	5.5	0.8	7.3	0.9	6.7	1.4	8.6	2.2	4.2
Three or more disorders	2.3	0.3	1.6	0.4	3.2	0.5	3.5	1.0	2.3	0.9	8.9*
N	4,332		2,148		1,332		589		263		

* Significant association between age and prevalence at the 0.05 level, two-sided test

Table 2 Ages at selected percentiles on the standardized age-of-onset (AOO) distributions of lifetime DSM-IV/CIDI disorders with projected lifetime risk at age 75^a

	Age-of-onset percentile								Projected lifetime risk at age 75	
	5	10	25	50	75	90	95	99	%	SE
<i>Anxiety disorders</i>										
Panic disorder	11	13	18	35	44	50	55	55	2.3	0.5
Generalized anxiety disorder	14	18	28	51	59	70	70	74	11.5	2.9
Social phobia	7	9	13	14	18	23	36	36	0.8	0.2
Specific phobia	5	5	5	7	13	15	18	41	4.3	0.5
Agoraphobia	5	8	11	13	14	19	21	23	0.8	0.2
Obsessive-compulsive disorder	19	24	32	54	66	66	68	70	8.9	2.3
Post-traumatic stress disorder	9	13	13	16	25	37	41	49	5.5	0.6
Any anxiety disorder	5	6	13	25	49	59	66	74	22.5	1.9
<i>Mood disorders</i>										
Major depressive disorder	14	19	29	46	59	71	71	71	28.0	7.1
Any mood disorder	14	19	29	46	59	71	71	71	28.3	7.0
<i>Behavioral disorders</i>										
Intermittent explosive disorder	13	13	14	19	31	46	46	57	2.2	0.4
Any behavioral disorder	7	13	14	17	31	46	46	57	2.3	0.4
<i>All disorders</i>										
Any disorder	5	8	14	29	54	66	71	74	40.8	6.6

^a Based on age-onset projections using the actuarial method. Although only disorders with a minimum of 30 cases are included in the analyses of individual disorders, less common disorders are included in the summary categories

Table 3 Inter-cohort differences in lifetime risk of DSM-IV/CIDI disorders^a

	Age group							χ^2_3
	18-34		35-49		50-64		65+	
	OR	95% CI	OR	95% CI	OR	95% CI	OR	
<i>Anxiety disorders</i>								
Panic disorder	5.4*	1.2-23.2	3.9	0.9-17.5	0.5	0.1-2.9	1.0	20.3*
Generalized anxiety disorder	3.0	0.9-9.7	2.2	0.7-6.8	1.0	0.3-3.0	1.0	7.3
Social phobia	2.3	0.3-16.1	2.2	0.2-24.8	0.7	0.1-8.1	1.0	3.0
Specific phobia	4.1*	1.4-12.3	3.2*	1.1-9.6	2.9	0.8-10.3	1.0	7.2
Agoraphobia	1.7	0.2-17.6	0.6	0.1-5.7	0.6	0.1-6.3	1.0	5.2
Post-traumatic stress disorder	5.3*	2.3-12.2	3.4*	1.6-7.3	1.8	0.7-4.6	1.0	28.2*
Obsessive-compulsive disorder	4.3*	1.6-11.8	2.4	0.9-6.4	3.1*	1.1-8.7	1.0	15.1*
Any anxiety disorder	2.8*	1.7-4.4	1.9*	1.2-3.1	1.5	0.9-2.5	1.0	25.4*
<i>Mood disorders</i>								
Major depressive disorder	2.9*	1.3-6.5	2.0	1.0-4.3	1.6	0.8-3.1	1.0	8.8*
Any mood disorder	2.9*	1.3-6.6	2.1*	1.0-4.5	1.6	0.8-3.2	1.0	7.9*
<i>Behavioral disorders</i>								
Attention-deficit/hyperactivity disorder
Intermittent explosive disorder	3.6	0.5-26.4	5.3	0.6-45.5	2.0	0.2-17.5	1.0	7.5
Any behavioral disorder	3.5	0.5-26.1	5.5	0.6-47.2	2.1	0.2-18.5	1.0	8.0*
<i>All disorders</i>								
Any disorder	2.8*	1.8-4.4	2.0*	1.3-3.2	1.7*	1.0-2.8	1.0	27.8*

*Significant association of age with risk at the 0.05 level, two-sided test

^aBased on discrete-time survival models with controls for person-year. Although only disorders with a minimum of 30 cases are included in the analysis of individual disorders, less common disorders are included in the summary categories

results are available on request). For anxiety disorders, the cohort effect is most dramatic for early-onset cases, less dramatic but nonetheless still statistically significant for late-onset cases, and non-significant for average-onset cases. For mood disorders, in comparison, the cohort effect is significant only for average-onset cases.

Socio-demographic correlates of lifetime risk

The associations of sex and education with first onset of any anxiety, any mood, and any behavioral disorder were examined by cohort using discrete-time survival analysis (detailed results are available on request). Women were found to have significantly higher odds of anxiety disorders ($OR = 1.8$, $\chi^2_1 = 17.4$, $p < 0.001$) and non-significantly higher odds of mood disorders ($OR = 1.6$, $\chi^2_1 = 3.6$, $p < 0.10$) than men and to have significantly lower odds of behavioral disorders ($OR = 0.38$, $\chi^2_1 = 5.0$, $p < 0.025$) than men in the total sample. None of these ORs varies significantly across cohorts ($\chi^2_3 = 0.7$ - 1.7 , $p = 0.64$ - 0.84). The educational categories considered here, in comparison, are not meaningfully related to lifetime risk of anxiety disorders ($\chi^2_4 = 2.1$, $p = 0.72$), mood disorders ($\chi^2_4 = 4.9$, $p = 0.29$), or behavioral disorders ($\chi^2_4 = 4.9$, $p = 0.29$).

Prevalence and severity of 12-month disorders

The 12-month prevalence of any DSM-IV/CIDI disorder in the IMHS is 13.6%, with 42.1% of cases classified mild,

36.0% moderate, and 21.9% serious. The disorder by far most likely to be classified serious is bipolar disorder, where 76.9% of 12-month cases are classified serious, followed by substance-related disorders (54.9%), MDD (39.1%), and a number of anxiety disorders (32.3-38.2% for panic disorder, GAD, social phobia, agoraphobia, and PTSD). Considerably smaller proportions of specific phobia (16.4%) and behavioral disorders (21.2%) are classified serious. Of the 3.0% of the sample classified as having a serious 12-month disorder (i.e., 21.9% of 13.6%), the majority (43.6%) have two or more disorders. The most common disorders among those classified serious are MDD (51%), followed by GAD (24.9%), specific phobia (21.1%), OCD (19.2%), PTSD (13.1%), panic disorder (11.5%) and intermittent explosive disorder (10.8%) (Table 4).

Socio-demographic correlates of 12-month disorders

The associations of five socio-demographic variables (sex, age, education, family income, marital status) with 12-month prevalence of broad classes of disorders were examined using logistic regression analysis (Table 5). None of these variables is significantly related to mood disorders. The odds of anxiety disorders, in comparison, are significantly elevated among women compared to men ($OR = 1.8$, $\chi^2_1 = 14.2$, $p < 0.001$) and among respondents with more than the lowest level of education compared to higher education ($\chi^2_3 = 15.6$, $p = 0.001$). The odds of behavioral disorders, finally, are significantly elevated among respondents in the age ranges 18-34 ($OR = 2.0$) and 35-49 ($OR = 5.0$) compared to ages 65+

Table 4 Twelve-month prevalence and severity of DSM-IV/CIDI disorders in the total sample (n = 4,332)

	Distribution of severity ^a								Prevalence among respondents with a serious disorder	
	Prevalence		Mild		Moderate		Serious			
	%	SE	%	SE	%	SE	%	SE	%	SE
<i>Anxiety disorders</i>										
Panic disorder	1.0	0.3	26.2	7.9	38.7	11.7	35.1	10.8	11.5	4.9
Generalized anxiety disorder	2.3	0.3	19.9	5.5	47.8	6.0	32.3	6.0	24.9	4.0
Social phobia	0.7	0.2	5.0	3.2	56.8	13.8	38.2	13.6	8.6	3.9
Specific phobia	3.8	0.4	43.5	6.3	40.1	6.3	16.4	3.7	21.1	3.9
Agoraphobia	0.5	0.2	29.0	16.2	38.7	16.5	32.3	16.1	5.4	3.2
Post-traumatic stress disorder	1.1	0.2	49.6	9.1	16.2	4.8	34.3	8.6	13.1	3.4
Obsessive-compulsive disorder	3.6	0.4	47.6	6.4	36.7	5.6	15.7	4.3	19.2	4.8
Any anxiety disorder	10.4	0.7	41.9	3.8	36.3	2.9	21.8	2.9	76.4	5.6
<i>Mood disorders</i>										
Dysthymic disorder	0.2	0.1	0.0		81.4	12.0	18.6	12.0	1.2	0.6
Major depressive disorder	3.9	0.4	24.8	3.6	36.1	5.5	39.1	5.1	51.0	4.6
Bipolar disorder	0.2	0.1	0.0		23.1	18.1	76.9	18.1	4.6	1.1
Any mood disorder	4.1	0.4	23.4	3.5	36.2	5.3	40.5	5.1	55.9	4.8
<i>Behavioral disorders</i>										
Attention-deficit/hyperactivity disorder	0.0		20.0	19.7	80.0	19.7	0.0		0.0	
Intermittent explosive disorder	1.5	0.2	47.9	6.3	30.5	9.3	21.6	9.1	10.8	4.2
Any behavioral disorder	1.5	0.2	47.8	6.2	31.0	9.2	21.2	9.0	10.8	4.2
<i>Substance-related disorders</i>										
Alcohol abuse	0.1	0.1	13.9	16.5	81.4	19.3	4.7	5.9	0.2	0.2
Alcohol dependence	0.0	0.0	0.0		0.0		100.0		0.4	0.2
Drug abuse	0.1	0.1	0.0		0.0		100.0		4.1	3.2
Drug dependence	0.0	0.0							0.0	
Any substance disorder	0.2	0.1	6.6	7.2	38.5	28.3	54.9	28.0	4.6	3.2
<i>All disorders</i>										
Any disorder	13.6	0.8	42.1	2.9	36.0	2.6	21.9	2.3	100.0	
Exactly one disorder	9.8	0.7	51.3	3.6	34.5	3.1	14.2	2.2	47.0	7.0
Two or more disorders	2.6	0.4	21.5	4.8	35.0	8.4	43.6	7.0	37.5	7.0
Three or more disorders	1.2	0.2	11.1	8.3	50.7	11.7	38.1	8.1	15.5	3.8
<i>Severity of disorders</i>										
Serious	3.0	0.4	0.0		0.0		100.0			
Moderate	4.9	0.4	0.0		100.0		0.0			
Mild	5.7	0.6	100.0		0.0		0.0			

^a See the text for a definition of the three severity categories. Percentages sum to 100% in each row

(OR = 1.6 in the age range 50-64; $\chi^2_3 = 11.2$, $p = 0.011$) and among respondents with the highest incomes (OR = 0.32-0.81 for respondents in lower income groups compared to the highest income group; $\chi^2_3 = 13.2$, $p = 0.004$),

Prevalence and intensity of 12-month treatment

Only 2.2% of IMHS respondents reported receiving treatment for emotional problems at any time in the 12 months before their interview (Table 6). This includes 10.8% of respondents with one or more 12-month DSM-IV/CIDI disorders in addition to 0.9% of respondents who met criteria for none of these disorders. The proportion in treatment is much higher for those with serious (23.7%) than moderate (9.2%) or mild (5.3%) disorders.

Two-thirds (65.6%) of patients were treated in the health-care system, with roughly equal proportions in the general medical (41.3% of all people who received treatment) and

specialty mental health (33.4%) sectors. A meaningful proportion of treatment was also provided, though, outside of the healthcare system by spiritual advisors (34.8%). Proportional treatment in the different treatment sectors does not vary significantly as a function of disorder severity, but caution is needed in interpreting this result, due to the very small numbers of people in the sample who received treatment and the resulting instability of the pattern.

Treatment intensity was generally low, as indicated by the fact that the mean number of visits was only 4.5, and only 21.2% of treated patients received treatment that we classified as at least minimally adequate (Table 7). However, both the mean number of visits (6.9 vs. 2.6, $t = 1.3$, $p = 0.20$) and the proportion of cases that received treatment classified as at least minimally adequate (36.5% vs. 15.6%, $t = 1.2$, $p = 0.23$) were higher for patients treated in the specialty than general medical sectors, although we cannot be sure that these differences are reliable, because of the small number of patients treated. It is also noteworthy that the small number of patients

**Table 5** Socio-demographic correlates of 12-month DSM-IV/CIDI disorders in the total sample (n = 4,332)^a

	Any mood disorder		Any anxiety disorder		Any behavioral disorder	
	OR	95% CI	OR	95% CI	OR	95% CI
Sex						
Male	1.0		1.0		1.0	
Female	1.4	0.8-2.3	1.8*	1.3-2.5	0.5	0.2-1.2
χ^2_1		1.4		14.2*		2.6
Age						
18-34	0.6	0.2-1.7	0.8	0.4-1.5	2.0	0.2-16.1
35-49	1.1	0.5-2.3	0.8	0.4-1.6	5.0	0.6-46.3
50-64	0.9	0.4-1.9	0.8	0.4-1.4	1.6	0.1-22.8
65+	1.0		1.0		1.0	
χ^2_2		5.0		0.9		11.2*
Income						
Low	1.1	0.6-2.0	1.1	0.8-1.6	0.8	0.4-1.7
Low-average	1.1	0.6-2.3	0.9	0.6-1.5	0.3	0.1-0.7
High-average	0.7	0.3-1.7	1.2	0.7-2.1	0.6	0.2-2.5
High	1.0		1.0		1.0	
χ^2_3		1.3		1.6		13.2*
Marital Status						
Married/Cohabiting	1.0		1.0		1.0	
Previously married	2.2	1.0-5.1	1.4	0.8-2.4	2.4	0.6-9.0
Never married	1.0	0.6-1.9	1.4*	1.0-2.1	1.7	0.8-3.3
χ^2_3		3.7		6.0*		4.4
Education						
Low	0.9	0.4-2.5	0.7	0.4-1.3	1.4	0.2-9.2
Low-average	1.0	0.5-2.2	1.1	0.6-2.0	1.4	0.4-4.9
High-average	0.7	0.3-1.6	1.3	0.8-2.1	1.4	0.2-8.0
High	1.0		1.0		1.0	
χ^2_3		1.4		15.6*		0.3
Overall						
χ^2_{12}		1093.9*		1756.3*		1745.9*

*Statistically significant at the 0.05 level, two-sided test

^a Based on multivariate logistic regression models**Table 6** Overall and proportional treatment of emotional problems in the 12 months before interview in the total sample and in sub-samples defined by severity of 12-month DSM-IV/CIDI disorders

	Total		None		Mild		Moderate		Serious		χ^2_3
	%	SE	%	SE	%	SE	%	SE	%	SE	
Overall treatment ^a											
Healthcare treatment											
General medical	0.9	0.3	0.4	0.2	0.2	0.2	2.4	1.1	13.6	5.3	7.0
Mental health specialty	0.7	0.2	0.4	0.1	2.5	1.7	1.2	0.9	7.1	4.3	4.5
Any healthcare treatment	1.5	0.3	0.7	0.2	2.7	1.7	3.6	1.5	17.4	5.9	9.0*
Non-healthcare treatment	0.8	0.2	0.2	0.1	2.6	1.9	5.6	2.8	6.6	3.2	9.0*
Any treatment	2.2	0.4	0.9	0.2	5.3	2.5	9.2	3.2	23.7	6.2	18.7*
N	4,332		3,743		224		219		146		
Proportional treatment ^a											
Healthcare treatment											
General medical	41.3	8.3	50.4	9.1	3.9	4.7	25.9	12.2	57.4	15.5	6.8
Mental health specialty	33.4	7.4	43.5	11.2	46.5	23.0	13.1	9.6	29.8	15.1	5.8
Any healthcare treatment	65.6	7.7	80.0	6.5	50.5	24.1	39.0	15.1	73.5	13.0	5.1
Non-healthcare treatment	34.8	7.7	20.0	6.5	49.5	24.1	61.0	5.1	27.6	13.0	5.1
N	103		45		12		19		27		

*Significant association between severity and treatment at the 0.05 level, two-sided test

^a The term *overall treatment* is used to describe the proportion of all respondents who received treatment, whereas the term *proportional treatment* is used to describe the proportion of patients (i.e., of those who received treatment) who were treated in each of the service sectors considered here. For example, 0.9% of all respondents received general medical treatment for their emotional problems in the 12 months before interview. These patients who received general medical treatment represent 41.3% of all respondents who received any form of treatment



Table 7 The associations of severity of 12-month DSM-IV/CIDI disorders with treatment intensity (number of visits) and treatment adequacy among respondents who received 12-month treatment

	Severity											
	Total		None		Mild		Moderate		Serious		χ^2_3 ¹	χ^2_1 ¹
Specialty treatment												
Number of visits (mean, SE)	6.9	3.1	3.7	1.1	1.2	0.2	3.4	0.6	16.6	7.6	18.6*	2.6
Adequate treatment ² (% , SE)	36.5	14.3	12.3	9.6	0.0	0.0	68.8	30.4	89.4	9.5	5.1	4.7*
Follow-up treatment ² (% , SE)	82.0	11.5	93.9	2.2	19.9	16.7	100.0	0.0	100.0	0.0	2.2	2.1
N	34		19		7		3		5			
General medical treatment												
Number of visits (mean, SE)	2.6	0.6	2.2	0.3	2.0	0.0	2.6	0.5	3.1	1.2	3.2	0.0
Adequate treatment ² (% , SE)	15.6	9.5	2.6	2.7	0.0	0.0	30.8	24.0	23.8	9.5	2.4	1.8
Follow-up treatment ² (% , SE)	85.5	9.8	98.1	2.0	100.0	0.0	92.1	8.1	71.4	19.7	1.7	1.7
N	39		18		1		6		14			
Any healthcare treatment												
Number of visits (mean, SE)	4.5	1.7	2.9	0.6	1.3	0.2	2.9	0.8	7.7	4.5	23.5*	1.4
Adequate treatment ² (% , SE)	21.2	7.9	6.7	5.3	0.0	0.0	43.6	20.8	36.7	19.1	5.1	3.8
Follow-up treatment ² (% , SE)	81.7	8.2	95.5	1.6	26.2	19.2	94.8	5.4	77.7	16.2	2.9	0.0
N	69		35		8		9		17			

*Significant association between severity and intensity/adequacy of treatment among respondents who received 12-month treatment at the 0.05 level, two-sided test
¹ χ^2 tests were used to evaluate differences in mean numbers of visits and in proportions of patients who received treated judged to be at least minimally adequate and who received follow-up treatment. The 3 degree of freedom tests were used to evaluate differences across all four sub-samples, while the 1 degree of freedom tests were used to evaluate differences between the severe-moderate and the mild-none sub-samples

²See the text for definitions of adequate treatment and follow-up treatment

in specialty treatment who were classified serious received significantly more intensive treatment than other specialty care patients (an average of 16.6 visits compared to 1.2-3.7 for other specialty patients; $\chi^2_3 = 18.6$, $p < 0.001$), indicating rationality in the allocation of treatment resources. Other evidence of this type of rationality is found in the fact that higher proportions of patients classified serious-moderate than mild-none received treatment classified as at least minimally adequate in the specialty sector (89.4-68.8% vs. 0.0-12.3%, $\chi^2_1 = 4.7$, $p = 0.03$), the general medical sector (23.8-30.8% vs. 0.0-2.6%, $\chi^2_1 = 1.8$, $p = 0.18$), and the overall healthcare system (36.7-43.6% vs. 0.0-6.7%, $\chi^2_1 = 3.8$, $p = 0.05$).

DISCUSSION

The above results should be interpreted with the following three limitations in mind. First, the IMHS excluded people who were homeless or institutionalized, who migrated out of the country, were too ill to be interviewed, or were residents of areas deemed too dangerous to be included in the survey. Most of these exclusions apply only to a small proportion of the population, the exceptions being internally displaced persons (IDPs) and those who migrated out of the country in response to the war. As noted in the introduction, some 1.5 million Iraqi are estimated to be internally displaced and another 2.5 million living in neighboring countries as per the United Nations High Commission for Refugees (UNHCR). Anecdotal evidence suggests that this 15% of the pre-invasion Iraqi population carries a high burden of mental illness (38,39).

Second, systematic survey non-response (i.e., people with mental disorders having a higher survey refusal rate than those without disorders) or systematic non-reporting (i.e., recall failure, conscious non-reporting, or error in diagnostic evaluations) could lead to bias in the estimates of disorder prevalence. From what we know about non-response and non-reporting bias in other surveys (40-42), it is likely that disorder prevalence was underestimated at least to some extent because of these biases.

Third, the CIDI is a lay-administered interview, which means that it is less capable than a clinician-administered diagnostic interview to make a comprehensive assessment of any mental disorder that the respondent might have. As noted above in the section on measures, a clinical reappraisal study that used blinded gold-standard clinical interviews (19) to make independent evaluations of disorder in a sub-sample of cases in some WMH surveys, found generally good individual-level concordance between diagnoses based on the CIDI and those based on clinical assessments (18). However, the CIDI only assessed DSM-IV disorders thought to be common. Therefore, the estimates of overall disorder prevalence are likely to estimate true prevalence to at least some degree.

Perhaps the most obvious omission of disorders concerns schizophrenia and the other non-affective psychoses (NAP). NAP were not assessed in the WMH surveys, based on evidence in a number of previous community epidemiological surveys that lay-administered psychiatric diagnostic interviews are incapable of generating accurate estimates of NAP (43-45), due to a very high rate of false positives. However, these same studies find that the vast majority of people with NAP in community epidemiological surveys are captured,





because they meet criteria for one or more of the more common disorders assessed in those surveys.

The above limitations would be expected to make the prevalence estimates reported here conservative, which means that the 13.6% overall 12-month prevalence estimate and the 18.8% overall lifetime prevalence estimate are likely to be lower bounds on the true population prevalence. We have no previous community epidemiological surveys of mental disorders in Iraq to use as a point of comparison. The only published studies focus on children who were exposed to war-related trauma (46-48), among whom the prevalence of mental disorders was, understandably, estimated to be quite high.

We are aware of only two other comparable large-scale epidemiological studies of adult mental disorders in the Arab world. One was carried out using a two-stage screening approach in separate samples of the urban, rural, and village populations of Iran (49). Prevalence estimates in the urban (16.6%) and rural (14.9%) samples were quite similar to the 13.6% 12-month IMHS prevalence estimate, although prevalence in the tribal sample was dramatically lower (2.1%). The other comparable survey was the WMH survey in Lebanon (50,51), where lifetime and 12-month prevalence estimates of any disorder (25.8% and 17.0%) were somewhat higher than in the IMHS. The Lebanon survey was carried out during a time of relative peace, whereas the IMHS was carried out during a time of extreme sectarian violence and military occupation by foreign powers.

In addition to the overall IMHS prevalence estimates being similar to other Arab surveys, the relative prevalence estimates of individual disorders are comparable to other epidemiological surveys. In particular, the findings that anxiety disorders are by far the most common class of mental disorders in Iraq and that MDD is the most common individual disorder are both consistent with other WMH surveys (52,53) as well as with the larger world literature (54). The only exception is the IMHS finding that OCD is one of the most common anxiety disorders. OCD is usually found to be a comparatively uncommon disorder (55,56). The finding that a low proportion of IMHS respondents with 12-month OCD were classified as seriously impaired is also inconsistent with the finding in other surveys that OCD is usually seriously impairing. We suspect, based on these findings, that OCD is over-diagnosed in the IMHS, although there is no way to confirm this suspicion in the absence of a clinical reappraisal survey.

The IMHS results regarding comparative age-of-onset distributions and severity distributions of individual mental disorders are quite consistent with those in the world literature. Regarding AOO, the IMHS data are consistent with previous studies in finding that phobias and behavioral disorders typically have onsets in childhood or adolescence and that other anxiety and mood disorders typically have later onsets as well as much wider inter-quartile ranges of their AOO distributions (53,57). Regarding severity, the IMHS data are consistent with the world literature in finding that bipolar disorder is the most seriously impairing of the

common mental disorders and that specific phobia is the least impairing (58,59).

The results regarding cohort effects strongly suggest that lifetime risk of mental disorders increased over the generations of Iraqis included in the survey, possibly as a function of inter-generational increases in sectarian violence. Consistent with this interpretation, the largest increase from the oldest to the youngest generation was for PTSD. An alternative explanation for this apparent cohort effect is that lifetime risk is actually constant across cohorts but appears to vary with cohort because onsets occur earlier in more recent than later cohorts, as might happen if there were secular changes in environmental triggers or to age-related differences in AOO recall accuracy. Another explanation might be that mortality has an increasing impact on sample selection bias as age increases. To study these possibilities, the cohort model was elaborated to determine whether inter-cohort differences decrease significantly with increasing age. Results show that cohort effects did, in fact, change with age, but not in a simple monotonic fashion. Non-monotonic patterns of this sort are most plausibly interpreted as due to historical events that led to inter-generational differences in disorder prevalence rather than to any simple age-related methodological (e.g., recall failure) or substantive (e.g., differential mortality) processes.

In terms of socio-demographic correlates, the IMHS data are similar to epidemiological surveys in other countries in finding elevated prevalence of anxiety disorders among women and of behavioral disorders among men (60-62), but quite different from other surveys in failing to find that women have a significantly higher prevalence of depression than men (63). The IMHS data are also different from other epidemiological survey data in failing to find an inverse relationship between socio-economic status (SES) and prevalence of mental disorders (58,64). Indeed, the IMHS data find *elevated* risk of lifetime mood disorders among people with high education and of 12-month anxiety disorders among people with all but the lowest level of education. At the same time, the IMHS data are consistent with other epidemiological data in finding an inverse relationship between SES and risk of behavioral disorders.

It is difficult to make sense of the two major discrepancies in the socio-demographic patterns in the IMHS compared to the world literature, the absence of a gender difference in depression and positive associations of education with anxiety and depression, without carrying out more detailed analyses than those reported here. We do know that these associations are consistent across the age range. We do not know, though, if the absence of gender differences in depression is due to some special features of gender roles in Iraq that remain to be investigated in more in-depth analyses of the data. Nor do we know if the elevated anxiety-depression rates among the well-educated is due to some special stresses experienced by the intelligentsia. Intriguing though these speculations are, their investigation must await more detailed analyses that have not yet been carried out.





The IMHS findings regarding treatment are similar to those in other low and lower-middle income WMH countries: only a minority of people with mental disorders received any treatment (65,66). The IMHS contains information about barriers to seeking treatment for mental disorders, but those data have not yet been analyzed. It is possible that these data will provide insights that can be used to help develop healthcare policies that will increase the proportion of people with mental disorders who seek treatment.

The IMHS results show that another important problem is that only a minority of the patients who seek treatment for mental disorders in Iraq receive treatment that meets even the most minimal standards of adequacy. However, there are several encouraging signs of rationality in the allocation of treatment resources: a) treatment intensity in the specialty mental health sector is significantly higher for patients with serious disorders than other disorders; b) the proportion of specialty sector patients whose treatment is judged to be at least minimally adequate is significantly higher for patients with serious-moderate disorders than mild-none; c) the proportion of general medical sector patients whose treatment is judged to be at least minimally adequate is higher, although not significantly so, for patients with serious-moderate disorders than mild-none.

We know from preliminary data analyses not reported here that the high rates of inadequate treatment are due mostly to patients dropping out before they receive a full course of treatment. However, we do not know the reasons for this premature termination. The IMHS includes questions about reasons for treatment dropout that have not yet been analyzed. These data might provide clues about ways to modify current treatment practices that could help increase patient retention. An initiative to formulate improved procedures for detection and treatment of mental disorders in primary care in Iraq is currently underway that could use such insights, although these efforts are being hindered by the disruption of normal service delivery systems caused by the violence that has gripped the country.

Further analyses of disorder prevalence and treatment barriers in the IMHS data need to focus on these disruptions to investigate the implications of war-related experiences on prevalence of mental disorders and on barriers to receiving adequate treatment of these disorders. These issues are the focus of ongoing analyses that will be the subject of future reports.

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References

1. Milliken CS, Auchterlonie JL, Hoge CW. Longitudinal assessment of mental health problems among active and reserve component soldiers returning from the Iraq war. *JAMA* 2007;298:2141-8.
2. Smith TC, Ryan MA, Wingard DL et al. New onset and persistent symptoms of post-traumatic stress disorder self reported after deployment and combat exposures: prospective population based US military cohort study. *BMJ* 2008;336:366-71.
3. Eaton KM, Hoge CW, Messer SC et al. Prevalence of mental health problems, treatment need, and barriers to care among primary care-seeking spouses of military service members involved in Iraq and Afghanistan deployments. *Mil Med* 2008;173:1051-6.
4. Renshaw KD, Rodrigues CS, Jones DH. Psychological symptoms and marital satisfaction in spouses of Operation Iraqi Freedom veterans: relationships with spouses' perceptions of veterans' experiences and symptoms. *J Fam Psychol* 2008;22:586-94.
5. Al-Jawadi AA, Abdul-Rhman S. Prevalence of childhood and early adolescence mental disorders among children attending primary health care centers in Mosul, Iraq: a cross-sectional study. *BMC Public Health* 2007;7:274.
6. Laban CJ, Gernaat HB, Komproe IH et al. Postmigration living problems and common psychiatric disorders in Iraqi asylum seekers in the Netherlands. *J Nerv Ment Dis* 2005;193:825-32.
7. Al-Saffar S. Integrating rehabilitation of torture victims into the public health of Iraq. *Torture* 2007;17:156-68.
8. Wenzel T. Torture. *Curr Opin Psychiatry* 2007;20:491-6.
9. Alkhuzai AH, Ahmad IJ, Hweel MJ et al. Violence-related mortality in Iraq from 2002 to 2006. *N Engl J Med* 2008;358:484-93.
10. Burnham G, Lafta R, Doocy S et al. Mortality after the 2003 invasion of Iraq: a cross-sectional cluster sample survey. *Lancet* 2006;368:1421-8.
11. Opinion Research Business. January 2008 - Update on Iraqi Casualty Data. www.opinion.co.uk/Newsroom_details.aspx?NewsId=88.
12. Murthy RS. Mass violence and mental health – recent epidemiological findings. *Int Rev Psychiatry* 2007;19:183-92.
13. Refugees International. Iraq. www.refintl.org/where-we-work/middle-east/iraq.
14. Silove D. The challenges facing mental health programs for post-conflict and refugee communities. *Prehosp Disaster Med* 2004;19:90-6.
15. Kessler RC, Üstün TB (eds). *The WHO World Mental Health Surveys: global perspectives on the epidemiology of mental disorders*. New York: Cambridge University Press, 2008.
16. Kessler RC, Üstün TB. The World Mental Health (WMH) Survey Initiative Version of the World Health Organization (WHO) Composite International Diagnostic Interview (CIDI). *Int J Methods Psychiatr Res* 2004;13:93-121.
17. Kessler RC, Üstün TB. The World Health Organization Composite International Diagnostic Interview. In: Kessler RC, Üstün TB (eds). *The WHO World Mental Health Surveys: global perspectives on the epidemiology of mental disorders*. New York: Cambridge University Press, 2008:58-90.





18. Haro JM, Arbabzadeh-Bouchez S, Brugha TS et al. Concordance of the Composite International Diagnostic Interview Version 3.0 (CIDI 3.0) with standardized clinical assessments in the WHO World Mental Health surveys. *Int J Methods Psychiatr Res* 2006;15: 167-80.
19. First MB, Spitzer RL, Gibbon M et al. Structured Clinical Interview for DSM-IV Axis I Disorders, Research Version, Non-patient Edition (SCID-I/NP). New York: Biometrics Research, New York State Psychiatric Institute, 2002.
20. Simon GE, VonKorff M. Recall of psychiatric history in cross-sectional surveys: implications for epidemiologic research. *Epidemiol Rev* 1995;17:221-7.
21. Knauper B, Cannell CF, Schwarz N et al. Improving the accuracy of major depression age of onset reports in the US National Comorbidity Survey. *Int J Methods Psychiatr Res* 1999;8:39-48.
22. Leon AC, Olfson M, Portera L et al. Assessing psychiatric impairment in primary care with the Sheehan Disability Scale. *Int J Psychiatry Med* 1997;27:93-105.
23. Agency for Health Care Policy and Research. Depression Guideline Panel, Vol 2: Treatment of major depression, Clinical Practice Guideline, No 5. Rockville: US Department of Health and Human Services, Public Health Service, Agency for Health Care Policy and Research, 1993.
24. American Psychiatric Association. Practice guideline for treatment of patients with panic disorder. Washington: American Psychiatric Association Press, 1998.
25. American Psychiatric Association. Practice guideline for treatment of patients with major depressive disorder, 2nd ed. Washington: American Psychiatric Association Press, 2000.
26. American Psychiatric Association. Practice guideline for treatment of patients with bipolar disorder, 2nd ed. Washington: American Psychiatric Association Press, 2002.
27. American Psychiatric Association. Practice guideline for treatment of patients with schizophrenia, 2nd ed. Washington: American Psychiatric Association Press, 2004.
28. Lehman AF, Steinwachs DM. Translating research into practice: schizophrenia patient outcomes research team (PORT) treatment recommendations. *Schizophr Bull* 1998;24:1-10.
29. Schatzberg AF, Nemeroff CB (eds). Textbook of psychopharmacology. Washington: American Psychiatric Publishing, 2004.
30. Ballesteros J, Duffy JC, Querejeta I et al. Efficacy of brief interventions for hazardous drinkers in primary care: systematic review and meta-analyses. *Alcohol Clin Exp Res* 2004;28:608-18.
31. Ost LG, Ferebee I, Furmark T. One-session group therapy of spider phobia: direct versus indirect treatments. *Behav Res Ther* 1997;35: 721-32.
32. Halli SS, Rao KV, Halli SS. Advanced techniques of population analysis. New York: Plenum, 1992.
33. SAS Institute. SAS/STAT software: changes and enhancements, Release 8.2. Cary: SAS Publishing, 2001.
34. Kaplan EL, Meier P. Nonparametric estimation from incomplete observations. *J Am Stat Assoc* 1958;53:457-81.
35. Efron B. Logistic regression, survival analysis, and the Kaplan-Meier curve. *J Am Stat Assoc* 1988;83:414-25.
36. Hosmer DW, Lemeshow S. Applied logistic regression. New York: Wiley, 1989.
37. Research Triangle Institute. SUDAAN: Professional Software for Survey Data Analysis, version 8.0.1. Research Triangle Park: Research Triangle Institute, 2002.
38. Ashraf H. Iraq's refugees and internally displaced people will face hardship wherever they go. *Lancet* 2003;361:630-1.
39. Morton MJ, Burnham GM. Iraq's internally displaced persons: a hidden crisis. *JAMA* 2008;300:727-9.
40. Allgulander C. Psychoactive drug use in a general population sample, Sweden: correlates with perceived health, psychiatric diagnoses, and mortality in an automated record-linkage study. *Am J Public Health* 1989;79:1006-10.
41. Eaton WW, Anthony JC, Tepper S et al. Psychopathology and attrition in the epidemiologic catchment area surveys. *Am J Epidemiol* 1992;135:1051-9.
42. Turner CF, Ku L, Rogers SM et al. Adolescent sexual behavior, drug use, and violence: increased reporting with computer survey technology. *Science* 1998;280:867-73.
43. Eaton WW, Romanoski A, Anthony JC et al. Screening for psychosis in the general population with a self-report interview. *J Nerv Ment Dis* 1991;179:689-93.
44. Kendler KS, Gallagher TJ, Abelson JM et al. Lifetime prevalence, demographic risk factors, and diagnostic validity of nonaffective psychosis as assessed in a US community sample. The National Comorbidity Survey. *Arch Gen Psychiatry* 1996;53:1022-31.
45. Kessler RC, Birnbaum H, Demler O et al. The prevalence and correlates of nonaffective psychosis in the National Comorbidity Survey Replication (NCS-R). *Biol Psychiatry* 2005;58:668-76.
46. Ahmad A, Mohamed HT, Ameen NM. A 26-month follow-up of posttraumatic stress symptoms in children after the mass-escape tragedy in Iraqi Kurdistan. *Nord J Psychiatry* 1998;52:357-66.
47. Ahmad A, Sofi MA, Sundelin-Wahlsten V et al. Posttraumatic stress disorder in children after the military operation "Anfal" in Iraqi Kurdistan. *Eur Child Adolesc Psychiatry* 2000;9:235-43.
48. Dyregrov A, Gjestaad R, Raundalen M. Children exposed to warfare: a longitudinal study. *J Trauma Stress* 2002;15:59-68.
49. Bash KW. Epidemiology of psychosomatic disorders in Iran. *Psychother Psychosom* 1984;42:182-6.
50. Karam EG, Mneimneh ZN, Dimassi H et al. Lifetime prevalence of mental disorders in Lebanon: first onset, treatment, and exposure to war. *PLoS Med* 2008;5:e61.
51. Karam EG, Mneimneh ZN, Karam AN et al. Prevalence and treatment of mental disorders in Lebanon: a national epidemiological survey. *Lancet* 2006;367:1000-6.
52. Demyttenaere K, Bruffaerts R, Posada-Villa J et al. Prevalence, severity and unmet need for treatment of mental disorders in the World Health Organization World Mental Health surveys. *JAMA* 2004;291:2581-90.
53. Kessler RC, Angermeyer M, Anthony JC et al. Lifetime prevalence and age-of-onset distributions of mental disorders in the World Health Organization's World Mental Health Survey Initiative. *World Psychiatry* 2007;6:168-76.
54. Kessler RC, Koretz D, Merikangas KR et al. The epidemiology of adult mental disorders. In: Levin BL, Pettila J, Hennessy KD (eds). Mental health services: a public health perspective, 2nd ed. New York: Oxford University Press, 2004:157-76.
55. Ruscio AM, Stein DJ, Chiu WT et al. The epidemiology of obsessive-compulsive disorder in the National Comorbidity Survey Replication. *Mol Psychiatry* (in press).
56. Stein MB, Forde DR, Anderson G et al. Obsessive-compulsive disorder in the community: an epidemiologic survey with clinical reappraisal. *Am J Psychiatry* 1997;154:1120-6.
57. Kessler RC, Amminger GP, Aguilar-Gaxiola S et al. Age of onset of mental disorders: a review of recent literature. *Curr Opin Psychiatry* 2007;20:359-64.
58. Kessler RC, Aguilar-Gaxiola S, Alonso J et al. Prevalence and severity of mental disorders in the WMH Surveys. In: Kessler RC, Üstün TB (eds). The WHO World Mental Health Surveys: global perspectives on the epidemiology of mental disorders. New York: Cambridge University Press, 2008:534-40.
59. Ormel J, Petukhova M, Chatterji S et al. Disability and treatment of specific mental and physical disorders across the world. *Br J Psychiatry* 2008;192:368-75.
60. Bekker MH, van Mens-Verhulst J. Anxiety disorders: sex differences in prevalence, degree, and background, but gender-neutral treatment. *Gen Med* 2007;4(Suppl. B):S178-93.
61. Klose M, Jacobi F. Can gender differences in the prevalence of mental disorders be explained by sociodemographic factors? *Arch Womens Ment Health* 2004;7:133-48.



62. Zahn-Waxler C, Shirtcliff EA, Marceau K. Disorders of childhood and adolescence: gender and psychopathology. *Annu Rev Clin Psychol* 2008;4:275-303.
63. Seedat S, Scott KM, Angermeyer MC et al. Cross-national associations between gender and mental disorders in the WHO World Mental Health Surveys. *Arch Gen Psychiatry* (in press).
64. Muntaner C, Eaton WW, Miech R et al. Socioeconomic position and major mental disorders. *Epidemiol Rev* 2004;26:53-62.
65. Wang PS, Aguilar-Gaxiola S, Alonso J et al. Use of mental health services for anxiety, mood, and substance disorders in 17 countries in the WHO World Mental Health Surveys. *Lancet* 2007;370:841-50.
66. Wang PS, Angermeyer M, Borges G et al. Delay and failure in treatment seeking after first onset of mental disorders in the World Health Organization's World Mental Health Survey Initiative. *World Psychiatry* 2007;6:177-85.